

REMARKS / ARGUMENTS

I. General Remarks and Remarks Regarding the Restriction Requirement

Please consider the application in view of the following remarks. Applicants thank the Examiner for her careful consideration of this application.

On November 14, 2005, during a telephone conversation with the Examiner, claims 1-32 were provisionally elected in response to the Examiner's restriction requirement. This provisional election is hereby confirmed, and claims 33-79 have been cancelled. Applicants reserve the right to present the cancelled claims in one or more continuing applications.

II. Disposition of Claims

Claims 1-32 are pending in this application. Claims 33-79 have been cancelled herein.

Claims 8-10 and 24-26 have been amended herein. These amendments are supported by the specification as filed.

Claims 1-4, 12, 16-20, 28, and 32 stand rejected under 35 U.S.C. § 102(b). Claims 5-11, 13-15, 21-27, and 29-31 stand rejected under 35 U.S.C. § 103(a).

III. Rejections of Claims

A. Rejections of Claims Under 35 U.S.C. § 102(b)

Claims 1-4, 12, 16-20, 28, and 32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,825,952 to Mzik ("Mzik"). Applicants respectfully disagree with each of these rejections.

In order to form a basis for a rejection under 35 U.S.C. § 102(b), a prior art reference must disclose each and every element as set forth in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2131 (2004). Moreover, when a prior art reference discloses a numerical range that touches or overlaps the claimed range, the reference must disclose the claimed range with "sufficient specificity to constitute an anticipation under the statute." *Id.* at § 2131.03 (II). This question of "sufficient specificity" is similar to that of whether a person of ordinary skill in the art could "clearly envisage" a species from a generic teaching. *Id.*; *see id.* at § 2131.02 (citing *In re Petering*, 301 F.2d 676 (CCPA 1962) (disclosure of a generic chemical formula, without more, cannot anticipate a specific compound having that formula where "the generic formula encompass[es] a vast number and perhaps even an infinite number of compounds"))).

Applicants respectfully assert that *Mzik* does not anticipate Applicants' invention under 35 U.S.C. § 102(b) because it does disclose every element of their claims, specifically claims 1-4, 12, 16-20, 28, and 32, as presented in this response, with sufficient specificity.

1. Claims 1-4, 12, 16-20, 28, and 32

With respect to claims 1 and 17, the Office Action states:

Mzik discloses a method of treating/fracturing a subterranean formation comprising the steps of: providing a servicing fluid comprising carbon dioxide and a hydrocarbon blend, wherein the hydrocarbon blend comprises at least about 65% hydrocarbons having from six carbons (C.sub.6) to eleven carbons (C.sub.11) (see abstract and column 2 lines 34-38); and placing the servicing fluid into the subterranean formation (see column 1 lines 12-15).

(Office Action at page 4.) Applicants respectfully disagree, and assert that *Mzik* does not specifically disclose a hydrocarbon blend having the composition recited in claims 1 and 17.

Mzik discloses the use of fracturing fluids that comprise a "hydrocarbon component," but this hydrocarbon component could comprise a vast number, and even an infinite number, of different blends having concentrations of hydrocarbons having 6 carbons (C₆) to 11 carbons (C₁₁), and a person of ordinary skill in the art cannot ascertain whether those concentrations fall within the range recited in claims 1 and 17. The concentrations of C₆-C₁₁ hydrocarbons recited in claims 1 & 17 are necessary, among other reasons, to optimize both the volatility and safety (e.g., maintains the flash point above a certain temperature to prevent accidental ignition) of the hydrocarbon blends. None of the hydrocarbon blends disclosed by *Mzik* will exhibit the same level of volatility as those caused by Applicants' claims while still remaining safe to handle and use. *Mzik* does disclose that the hydrocarbon component may be present in the fracturing fluids disclosed therein in an amount of 5% to 85% by volume. (See *Mzik* at col. 2, ll. 34-38). Further, the example in *Mzik* states that the hydrocarbon distillate used therein "contained over 80 percent of C₅-C₁₄ constituents," and that "[t]he average molecular mass of the hydrocarbon composition was lower than 120." (*Mzik* at col. 3, ll. 1-4.) However, even these exemplified hydrocarbon components could comprise a large number of different concentrations of C₆-C₁₁ hydrocarbons that may or may not fall within the range recited in claims 1 and 17, and there is no further teaching in *Mzik* to narrow the broad range of possible concentrations of C₆ to C₁₁ hydrocarbons in to where a person of ordinary skill in the art would "at once envisage" a hydrocarbon blend that comprises at least about 65% hydrocarbons having

6 carbons (C₆) to 11 carbons (C₁₁). See MANUAL OF PATENT EXAMINING PROCEDURE § 2131.02 (2005). Thus, *Mzik*'s broad and generic disclosure does not disclose the hydrocarbon blends recited in claims 1 and 17 with sufficient specificity to anticipate those claims.

Therefore, Applicants respectfully submit that independent claims 1 and 17 are patentable over *Mzik*. Moreover, since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and since claims 2-4, 12, 16, 18-20, 28, and 32 depend, either directly or indirectly, from claim 1 or 17, these dependent claims are allowable for at least the same reasons. See 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

2. Claims 2 and 18

With respect to claims 2 and 18, the Office Action states:

Mzik discloses a hydrocarbon blend that comprises at least about 65% hydrocarbons having from seven carbons (C.sub.7) to ten carbons (C.sub.10) (see abstract and column 2 lines 34-38).

(Office Action at page 5.) Applicants respectfully disagree because *Mzik* does not disclose a hydrocarbon blend that comprises at least about 65% hydrocarbons having seven carbons (C₇) to ten carbons (C₁₀). As discussed above, *Mzik* only discloses the concentrations for broad ranges of hydrocarbon sizes, which may or may not fall within the ranges recited in claims 2 and 18. This disclosure does not enable a person of ordinary skill in the art to "at once envisage" a hydrocarbon blend that comprises at least about 65% hydrocarbons having seven carbons (C₇) to ten carbons (C₁₀). See MANUAL OF PATENT EXAMINING PROCEDURE § 2131.02 (2005). Without a specific disclosure of the concentration ranges for C₇-C₁₀ hydrocarbons, *Mzik* cannot anticipate claims 2 and 18.

Therefore, Applicants respectfully assert that claims 2 and 18 are patentable over *Mzik* because it fails to disclose the hydrocarbon compositions recited therein, in addition to the reasons discussed in Section III.A.1. above. Accordingly, Applicants respectfully request the withdrawal of these rejections.

3. Claims 3 and 19

With respect to claims 3 and 19, the Office Action states:

Mzik discloses a hydrocarbon blend where about 85% of the hydrocarbon blend comprises hydrocarbons having eight carbons (C.sub.8), hydrocarbons having nine carbons (C₉), or a mixture of

hydrocarbons having eight carbons (C.sub.8) and hydrocarbons having nine carbons (C9) (see abstract and column 2 lines 34-48).

(Office Action at page 5.) Applicants respectfully disagree because *Mzik* does not disclose a hydrocarbon blend that comprises at least about 85% hydrocarbons having eight carbons (C₈), hydrocarbons having nine carbons (C₉), or a mixture thereof. As discussed above, *Mzik* only discloses the concentrations for broad ranges of hydrocarbon sizes, which may or may not fall within the ranges recited in claims 3 and 19. This disclosure does not enable a person of ordinary skill in the art to “at once envisage” a hydrocarbon blend that comprises at least about 85% hydrocarbons having eight carbons (C₈), hydrocarbons having nine carbons (C₉), or a mixture thereof. See MANUAL OF PATENT EXAMINING PROCEDURE § 2131.02 (2005). Without a specific disclosure of the concentration ranges for C₈ and C₉ hydrocarbons, *Mzik* cannot anticipate claims 3 and 19.

Therefore, Applicants respectfully assert that claims 3 and 19 are patentable over *Mzik* because it fails to disclose the hydrocarbon compositions recited therein, in addition to the reasons discussed in Section III.A.1. above. Accordingly, Applicants respectfully request the withdrawal of these rejections.

B. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik*

Claims 5, 6, 14, 15, 21, 22, 30, and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mzik*. Applicants respectfully disagree with each of these rejections.

To form a basis for a § 103(a) rejection, a prior art reference must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2004). In order for the determination of optimum or workable ranges of certain variables to be considered “routine experimentation,” “a particular parameter must be recognized as a result-effective variable, *i.e.*, a variable which achieves a recognized result.” *Id.* at § 2144.05 (II.B.) (2004) (citing *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)). However, *Mzik* does not adequately teach or suggest every element of the rejected claims, and the optimal concentration ranges recited in those claims would not be discoverable through “routine experimentation.” Therefore, Applicants respectfully assert that the rejected claims are patentable over *Mzik*.

1. Claims 5 and 21

With respect to claims 5 and 21, the Office Action states:

Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. *Mzik* further teaches that the hydrocarbon

component can be a C₅-C₁₄ constituent. *Mzik* does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having more than ten carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend with less than 1% hydrocarbon having more than 10 carbons.

(Office Action at page 6.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 5 and 21.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 5 and 21 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than 1% hydrocarbons having more than ten carbons (C₁₀). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as many as 14 carbons (C₁₄). (See *Mzik* at col. 2, ll. 34-38.)

Finally, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 5 and 21 would not be considered “routine experimentation” because *Mzik* does not teach or recognize that the concentration of hydrocarbons having more than 10 carbons achieves any particular result. See MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2004). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 5 and 21, and request the withdrawal of these rejections.

2. Claims 6 and 22

With respect to claims 6 and 22, the Office Action states:

Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. *Mzik* further teaches that the hydrocarbon component can be a C₅-C₁₄ constituent. *Mzik* does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having fewer than seven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend with less than 1% hydrocarbon having fewer than seven carbons.

(Office Action at page 6.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 6 and 22.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 6 and 22 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than 1% hydrocarbons having fewer than seven carbons (C₇). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as few as 5 carbons (C₅). (See *Mzik* at col. 2, ll. 34-38.)

Finally, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 6 and 22 would not be considered “routine experimentation” because *Mzik* does not teach or recognize that the concentration of hydrocarbons having fewer than 7 carbons achieves any particular result. See MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2004). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 6 and 22, and request the withdrawal of these rejections.

3. Claims 14 and 30

With respect to claims 14 and 30, the Office Action states:

Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. *Mzik* further teaches that the hydrocarbon component can be a C₅-C₁₄ constituent. *Mzik* does not specifically teach a hydrocarbon blend with less than about 1% hydrocarbons having fewer than seven carbons about 5% hydrocarbons having seven carbons, about 44% hydrocarbons having eight carbons, about 43% hydrocarbons having nine carbons, about 8% hydrocarbons having ten carbons, and less than about 1% hydrocarbons having more than ten carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising less than about 1% hydrocarbons having fewer than seven carbons (C.sub.7), about 5% hydrocarbons having seven carbons (C.sub.7); about 44% hydrocarbons having eight carbons (C.sub.8); about 43% hydrocarbons having nine carbons (C.sub.9); about 8% hydrocarbons having ten carbons (C.sub.10); and less than about 1% hydrocarbons having more than ten carbons (C.sub.10).

(Office Action at page 7.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 14 and 30.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 14 and 30 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than about 1% hydrocarbons having fewer than seven carbons (C_7), about 5% hydrocarbons having seven carbons (C_7), about 44% hydrocarbons having eight carbons (C_8), about 43% hydrocarbons having nine carbons (C_9), about 8% hydrocarbons having ten carbons (C_{10}), and less than about 1% hydrocarbons having more than ten carbons (C_{10}). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as few as 5 carbons (C_5) and/or as many as 14 carbons (C_{14}). (See *Mzik* at col. 2, ll. 34-38.)

Finally, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 14 and 30 would not be considered “routine experimentation” because *Mzik* does not teach or recognize that the concentration of hydrocarbons of these sizes achieves any particular result. See MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2004). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 14 and 30, and request the withdrawal of these rejections.

4. Claims 15 and 31

With respect to claims 15 and 31, the Office Action states:

Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. *Mzik* further teaches that the hydrocarbon component can be a C_5 - C_{14} constituent. *Mzik* does not specifically teach a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons.

(Office Action at page 7-8.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 15 and 31.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 15 and 31 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises substantially no hydrocarbons having more than eleven carbons (C₁₁). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as many as 14 carbons (C₁₄). (See *Mzik* at col. 2, ll. 34-38.)

Finally, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 15 and 31 would not be considered “routine experimentation” because *Mzik* does not teach or recognize that the concentration of hydrocarbons having fewer than 7 carbons achieves any particular result. See MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2004). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 15 and 31, and request the withdrawal of these rejections.

C. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik* in View of U.S. Patent No. 6,511,944

Claims 7-10, 13, 23-26, and 29 stand rejected under 35 U.S.C. § 103(a) over *Mzik* in view of U.S. Patent No. 6,511,944 to Taylor *et al.* (“*Taylor*”). With respect to these rejections, the Office Action states:

With respect to claims 7-10 and 23-26, *Mzik* does not teach a service fluid comprising a gelling agent present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend. Taylor teaches a hydrocarbon servicing fluid comprising a gelling agent of ferric iron or aluminum polyvalent metal salt of a phosphoric acid ester present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend in order to minimize volatile phosphorous in refinery distillation towers (see column 3 lines 5-59 and column 6 lines 52-55). It would have been obvious to one having ordinary skill in the art to modify the servicing fluid of *Mzik* by adding a gelling agent of ferric acid in the amount of 0.1% to 2.5% as taught by Taylor *et al.* in order to minimize volatile phosphorous in refinery distillation towers.

With respect to claims 13 and 29, *Mzik* does not teach a servicing fluid comprising a delayed gel breaker. However, Taylor *et al.* teaches adding a delayed gel breaker to a hydrocarbon servicing fluid in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in the

subterranean formation (see column 5 lines 31-35). It would have been obvious to modify the servicing fluid of *Mzik* by adding a delayed gel breaker as taught by Taylor et al. in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in a subterranean formation.

(Office Action at pages 8-9.) Applicants respectfully disagree with these rejections.

To form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2004). However, as discussed in Section III.A.1. above, *Mzik* does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17. Nor does *Taylor* teach or suggest hydrocarbon blends having these compositions. *Taylor* teaches gelled hydrocarbon liquids generally, but does not discuss the compositions of those fluids with respect to the size of the hydrocarbons therein. (See *Taylor* at col. 4, ll. 27-37.)

Because this combination of references does not teach all elements of claims 1 and 17, the combination cannot obviate claims 1 and 17. Since “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers,” and since claims 7-10, 13, 23-26, and 29 depend, directly or indirectly, from claim 1 or 17, these dependent claims include the limitations of claims 1 or 17, that neither *Mzik* nor *Taylor* teaches or suggests. See 35 U.S.C. § 112 ¶ 4 (2004). Therefore, Applicants respectfully assert that claims 7-10, 13, 23-26, and 29 are allowable over the combination of *Mzik* and *Taylor*, and respectfully request the withdrawal of the rejections thereto.

D. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik* in View of U.S. Patent No. 3,954,626

Claims 11 and 27 stand rejected under 35 U.S.C. § 103(a) over *Mzik* in view of U.S. Patent No. 3,954,626 to Greminger, Jr. et al. (“*Greminger, Jr.*”). With respect to these rejections, the Office Action states:

Mzik does not teach a fracturing fluid which comprises a LPG. [Greminger], Jr. et al. teaches a servicing fluid which comprises LPG in order to provide a mixture having a higher critical temperature than carbon dioxide alone (see column 3 lines 29-32). It would have been obvious to modify the invention of *Mzik* by adding a LPG fluid to the servicing/fracturing fluid as taught by Greminger, Jr. et al. in order to provide a mixture having a higher critical temperature than carbon dioxide alone.

(Office Action at page 9.) Applicants respectfully disagree with these rejections.

To form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2004). However, as discussed in Section III.A.1. above, *Mzik* does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17. Nor does *Greminger, Jr.* teach or suggest hydrocarbon blends having these compositions. Rather, *Greminger, Jr.* only teaches the use of fracturing fluids that comprise liquid carbon dioxide, an anhydrous alcohol, and a hydroxypropyl methylcellulose, but does not discuss the compositions of those fluids with respect to the size of the hydrocarbons therein. (See *Greminger, Jr.* at Abstract.)

Because this combination of references does not teach all elements of claims 1 and 17, the combination cannot obviate claims 1 and 17. Since “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers,” and since claims 11 and 27 depend, directly or indirectly, from claim 1 or 17, these dependent claims include the limitations of claims 1 or 17, that neither *Mzik* nor *Greminger, Jr.* teaches or suggests. See 35 U.S.C. § 112 ¶ 4 (2004). Therefore, Applicants respectfully assert that claims 11 and 27 are allowable over the combination of *Mzik* and *Greminger, Jr.*, and respectfully request the withdrawal of the rejections thereto.

**SUMMARY AND PETITION FOR EXTENSION OF TIME OF ONE MONTH
TO FILE THIS RESPONSE**

In light of the above remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants hereby petition under the provisions of 37 C.F.R. § 1.136(a) for a one-month extension of time to file this Response, up to and including April 2, 2006.

The Commissioner is hereby authorized to debit the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300 in the amount of \$300.00 for (1) the fee of \$120.00 under 37 C.F.R. § 1.17(a)(1) for the One-Month Petition for Extension of Time to File

this Response, and (2) the fee of \$180.00 for the fee under 37 C.F.R. § 1.17(p) for consideration of an Information Disclosure Statement after mailing of the first Non-Final Office Action on the merits. Should the Commissioner deem that any additional fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert A. Kent", written over a horizontal line.

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